
Consider Adding Info on panel facets
and advanced reflectors

USA Trough Workshop Concentrator Status & Development

Tim Wendelin

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- Goal - Improve concentrator technology to enable troughs to penetrate both near and longer term real markets.
 - Through cost reduction
 - Re-engineer components/new designs for lower 1st costs
 - Re-engineer components to be manufactured less expensively
 - Through performance improvements
 - Re-engineer components/new designs for better performance
 - Through decreased O&M
 - Re-engineer components to be more trouble free
 - Combinations of the above

- **Current Status**

- SunLab recently issued an RFP resulting in a concentrator development contract with Duke Solar.
- EuroTrough
- This workshop.
 - Purpose: Develop a plan consisting of a prioritized list of proposed concentrator activities supporting USA Trough.

- Issues

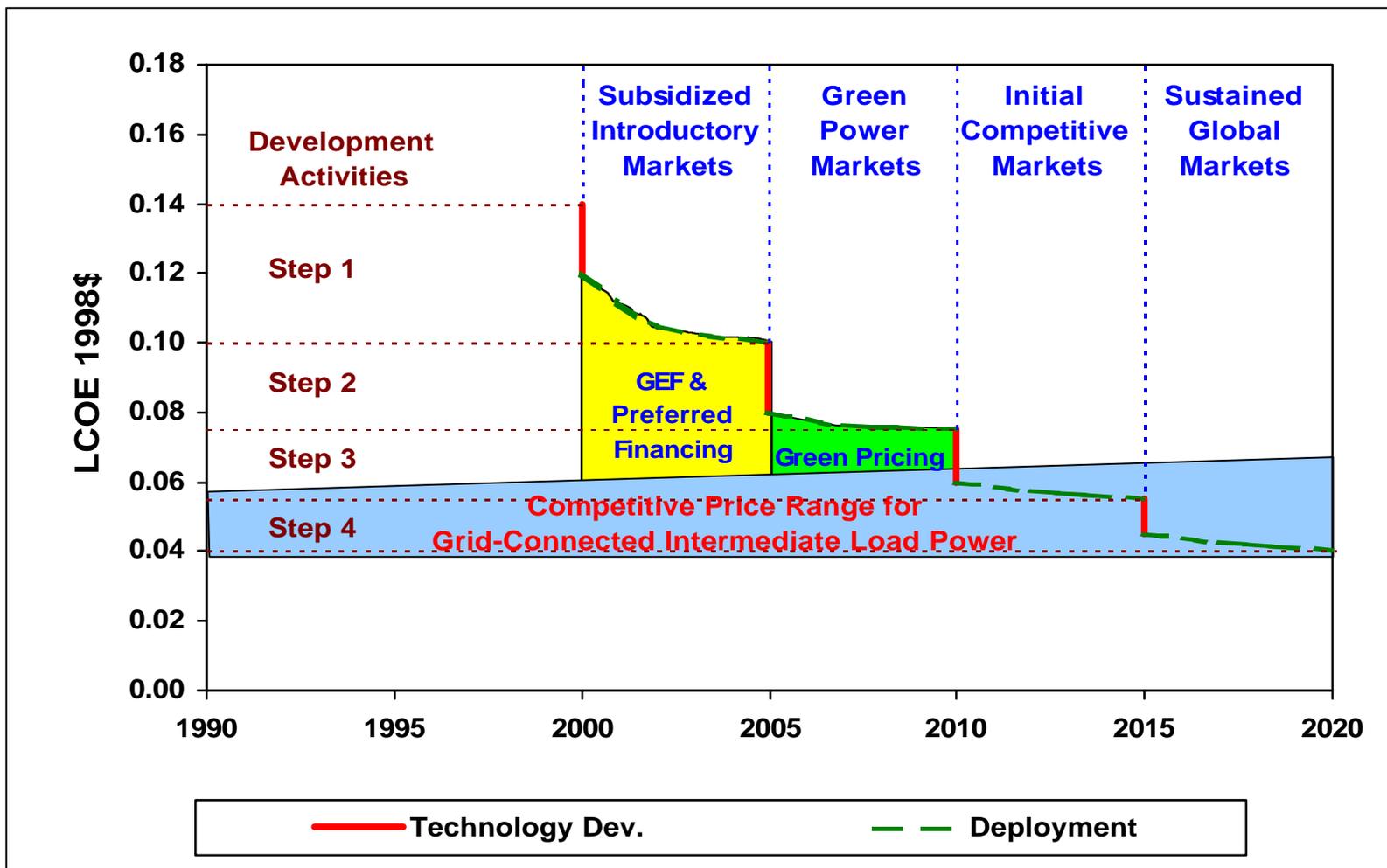
- Establish baseline
- Need near and longer term view
- Cost
- Performance
- O&M
- Drives
- Controls
- Flex Hoses/Ball Joints
- Others: Field preparation, ???



CONCENTRATING SOLAR POWER

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National Renewable Energy Laboratory, Golden CO



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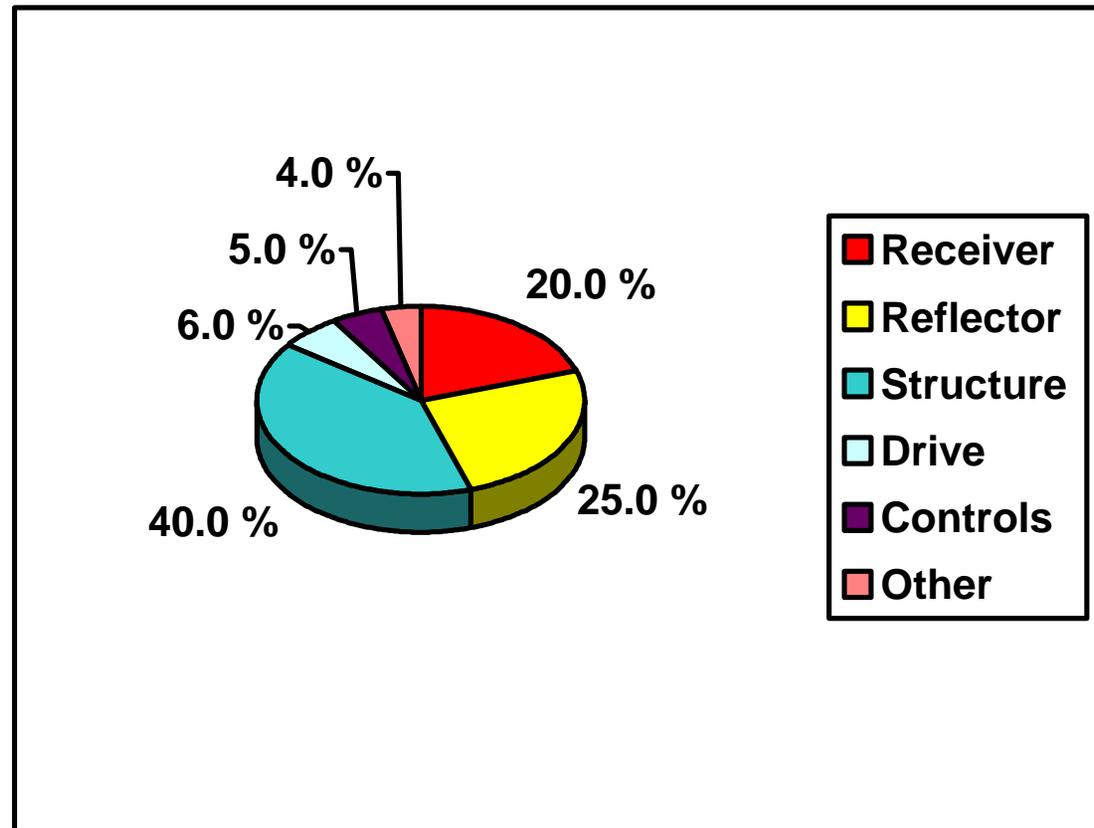
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This is a repeat

- Issues
 - Establish baseline
 - Need near and longer term view
 - Cost
 - Performance
 - O&M
 - Drives
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 - Others: Field preparation, ???

Projected Solar Field Costs: \$215/m²



- Near Term Objectives (2-5 year time frame)

- Establish baseline - Suggest LS-2 over LS-3. Benefits: Optically accurate, maintains alignment, requires less O&M. Need good cost data though. LS-3 advantages: size, ease of assembly and known costs but should it be baseline?
- Cost - Identify/develop reflector, structure, and/or drive modifications/designs which would result in significant (20%) cost savings and be implemented (designed, tested, proven) in near term.
- Performance - For near term, considered secondary to cost. Performance improvement concepts which can be implemented in near term w/o increasing costs should be considered.
- O&M - Identify concepts which would reduce O&M costs by ???% within near term. (Mirror cleaning, field alignment)

- Near Term Objectives (continued)

- Drives - ???
- Controls - ???
- Flex Hoses/Ball joints - ???
- Others - ???

- Near term approach (deployable in 2-5 year time frame)

- Industry and SunLab working together to:

- Perform DFMA on baseline design with goal of reducing manufacturing costs by ???%
- Collaborate with EuroTrough, ([What about Duke??](#)) understand where they are, where they are going. Incorporate lessons learned, leverage on knowledge base.
- Develop RFP's targeted at specific areas identified by DFMA and Eurotrough results
- Manufacture and test resultant hardware to validate performance
- [Test loop at existing SEGS facility](#)
- Implement results in next plant

- Longer term objectives (5- 10 years)

- Cost - Identify and develop innovative designs which have potential to be significantly less costly (30-50%?) than baseline but require more R&D to get there.
- Performance - Identify and develop innovative designs which improve optical performance W/O increasing installed costs. Highly dependent on other factors such as current/new end user power cycles, HCE designs, etc.
 - New reflector concepts/materials
 - New optical geometries
 - Secondaries
 - Trough tilting
 - Fixed receivers

• Etc.



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- Longer term objectives (continued)

- O&M - Identify and develop new designs/strategies significantly minimizing O&M costs
 - New mirror materials requiring minimal cleaning
 - In-field tools for rapid alignment assessment and adjustments
 - New cleaning techniques/strategies
 - State of the art mirror with 30 year + lifetime
- Controls - RF communications, fiber optics, etc.
- Flex hoses/ball joints
- Other

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- Long-term approach (deployable in 5-10 year time frame)
 - Develop RFP's targeted at specific areas
 - Utilize SunLab for ideas and development and testing